

G8 John Snow and the cause of cholera

- 1 He noticed that he did not get cholera even though he was often breathing the same air as his patients. Also, he noticed that it was the digestive system that was affected first when people got cholera.
- 2 He guessed that the only way the disease could spread so quickly was if it was in water. He calculated that most deaths were close to the Broad Street pump. He found out that a woman who lived many miles away who died of cholera had used water from the Broad Street pump. (He also noticed that no one in the Brewery in Broad Street died – he found out that they never drank water, only beer. And no one in the Workhouse in Broad Street died either – he found out that they had their own well.)
- 3 Take a sample of water and look at it under a microscope to see if it contains cholera bacteria. Spread some of the water onto agar jelly and see if cholera bacteria grow.
- 4 The water was probably contaminated with waste from the bodies of people who were infected with the cholera bacterium. (In fact, the well was found to be contaminated with sewage.)
- 5 The water is treated with chlorine, which kills bacteria.

G9 Dr Snow's map

- 1 88 (but you could accept a number near this as the circle cuts through a group of 4)
- 2 6
- 3 The Upper Rupert St pump is closest.
- 4 These people must have been getting their water from Broad Street. Although these streets are closer to the Upper Rupert St pump than the Broad Street pump as the crow flies, in terms of distance to be walked the Broad Street pump might be closer. Or perhaps people preferred the taste of the water from the Broad Street pump. Perhaps the streets on the way to the Broad Street pump were more pleasant or less dangerous to walk through than the ones on the way to the Upper Rupert St pump.

End of Unit test answers

- 1 a B
b B
c C
d A
e C
f A (6)
- 2 Pathogen; white; antibodies; immune; vaccine (5)
- 3 a Bacteria (1)
b To destroy/kill any bacteria already present (1)
c So that the starter culture/bacteria being added would not be killed (1)
d Left it somewhere warmer (than a refrigerator) (1)
e An acid had been produced; lactic (acid) (2)
- 4 a Solution containing yeast labelled in left hand tube; lime water labelled in right hand tube (2)
b Sugar/glucose (1)
c Bubbles; goes cloudy; carbon dioxide produced by yeast (3)
d Production of carbon dioxide makes the dough rise (2)

Total marks: 25

Extension question

5 a So that there were no bacteria/fungi on it; she only wanted to test one particular kind of bacterium (2)

b

Disc	Diameter of clear area/mm
P	0 (allow if disc itself has been measured)
Q	16
R	8
S	14

Table can be clearly understood; table has clearly headed rows and columns; units are in the heading (not in the body of the table); all measurements are correct (4)

c Q (1)

d Diffusion; random movement of particles (2)

e 'Flu is caused by a virus/antibiotics do not kill viruses (1)

Total marks for Extension: 10

Suggested levels for marks gained

6–10 working towards level 4

11–20 working towards level 5

20+ working towards level 6